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EXAMINER	
BELL, MELTIN	

ART UNIT	PAPER NUMBER
2129	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/831,262	GAMMERMAN ET AL.	
	Examiner	Art Unit	
	Meltin Bell	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *1-9,11,13 and 16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10,12,14,15,17 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *3/8/05*.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

This action is responsive to application **09/831,262** filed 6/29/01, the Specification Corrections and Amendment filed 11/22/04 as well as the Request for Continued Examination (RCE) filed 11/24/04. Claims 10, 12, 14-15 and 17-18 filed by the applicant have been entered and examined. Claims 1-9, 11, 13 and 16 have been canceled as requested by the applicant. An action on the merits of claims 10, 12, 14-15 and 17-18 follows.

Priority

Applicant's claim for foreign priority based on application PCT/GB99/03737 filed under 35 USC 371 on November 9, 1999 and 9824552.5 filed in the United Kingdom on **November 9, 1998** is acknowledged.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 18 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The language of the claims (e.g. "data carrier") raise a question as to whether the claims are directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical

application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101. For example, if the preamble of claim 18 was amended to recite 'A classification program stored on a computer readable medium for classifying data by performing the following steps:', it will be statutory in most cases since use of technology permits the function of the descriptive material to be realized.

Claim Rejections - 35 USC § 103

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Applicant's arguments have been fully considered, but are moot in view of new grounds of rejection. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Office presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under

37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Office to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Currently amended and previously presented claims 10, 14-15 and 17-18 stand rejected under 35 U.S.C. 103(a) as being obvious over *Mizuno et al* USPN 5,577,166 "Method and apparatus for classifying patterns by use of neural network" (November 19, 1996) in view of *Tsuboka* USPN 5,608,841 "Method and apparatus for pattern recognition employing the hidden Markov model" (March 4, 1997) in view of *McDonough et al* USPN 5,625,748 "Topic discriminator using posterior probability or confidence scores" (April 29, 1997) and in further view of *Kulkarni et al* "On the existence of strongly consistent rules for estimation and classification" (17-22 Sept. 1995).

Regarding claim 10:

Mizuno et al teaches,

- an input device for receiving a plurality of training classified examples and at least one unclassified example (FIG. 2, item 23)
- a memory for storing said classified and unclassified examples (column 2, lines 54-59, "classification includes steps ... of the comparison")
- an output terminal for outputting a predicted classification for said at least one unclassified example (Fig. 2, item 24)

- a processor for identifying the predicted classification of said at least one unclassified example (Fig. 2, item 21)

- wherein the processor includes:

- classification allocation means for allocating potential classifications to each said unclassified example and for generating a plurality of classification sets, each said classification set containing said plurality of training classified examples with their classification and said at least one unclassified example with its said allocated potential classification (column 5, lines 42-51, "As shown in FIG. 3 ... program module")

- assay means including an example valuation device which determines individual strangeness values for each said training classified example and said at least one unclassified example having an allocated potential classification, the assay means determining an overall strangeness value valid under the iid assumption for each said classification set in dependence on said individual strangeness values (Figs. 4-8; Fig. 9, items 94-96; column 7, lines 1-12, "FIG. 5 shows an ...the training data")

- a strength of prediction monitoring device (column 11, lines 19-47, "FIG. 10 is a ... and a display 24") for determining a confidence value for said predicted classification on the basis of said overall strangeness value assigned by said assay means to one of said classification sets (Fig. 6; Fig. 9, items 94-96; column 10, lines 32-36, "The execution history ... control processing module 15"; column 13, lines 13-23, "an input pattern ... increase the reliability")

Mizuno et al doesn't explicitly teach a strength of prediction monitoring device for determining a confidence value for said predicted classification on the basis of said

overall strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs, a comparative device for selecting the classification set to which the most likely allocated potential classification for said at least one unclassified example belongs, wherein said predicted classification output by the output terminal is said most likely allocated classification according to said overall strangeness values assigned by said assay means or a single strangeness value (d(y)) valid under the independently and identically distributed assumption while *Tsuboka* teaches,

- a second most likely allocated potential classification of said at least one unclassified example belongs (column 11, lines 11-20, "In ordinary vector ... the object function")
- a comparative device for selecting the classification set to which the most likely allocated potential classification for said at least one unclassified example belongs, wherein said predicted classification output by the output terminal is said most likely allocated classification according to said overall strangeness values assigned by said assay means (Abstract, "A method and ... y is compared"; column 11, lines 11-20, "In ordinary vector ... the object function")

McDonough et al teaches,

- a single strangeness value (column 2, lines 9-19, "While it is ... were initially misclassified") valid under the independently and identically distributed assumption (column 8, lines 54-59, "There are several classes ... in a multinomial model")
- a strength of prediction monitoring device for determining a confidence value (column 5, lines 62-67, "The event frequencies ... that a particular"; column 6, lines 1-3, "known

topic is ... ongoing, training procedure") for said predicted classification on the basis of said single strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs

Kulkarni et al teaches,

- a strength of prediction monitoring device (Abstract).

However, Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

Motivation – The portions of the claimed apparatus would have been a highly desirable feature in this art for maintaining accuracy (*Tsuboka*, column 4, lines 34-44, "Such phenomenon is ... discrete HMM computations"), working when little or no transcribed training data is available for the topic modeling component of the discriminator (*McDonough et al*, column 12, lines 42-64, "The topic discriminator ... it is available") and characterizing when strongly consistent estimators exist (*Kulkarni et al,* page 255, INTRODUCTION AND FORMULATION section, paragraph 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Mizuno et al* as taught by *Tsuboka, McDonough et al* and *Kulkarni et al* for the purpose of maintaining accuracy when little or no transcribed training data is available as well as characterizing strongly consistent estimators. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a single strangeness value (d(y)) since Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

Regarding claim 14:

Mizuno et al teaches,

- an input device for receiving a plurality of training classified examples and at least one unclassified example (FIG. 2, item 23)

- a memory for storing said classified and unclassified examples (column 2, lines 54-59, "classification includes steps ... of the comparison")

- stored programs including an example classification program (column 5, lines 42-51, "As shown in FIG.3 ... the program module")

- an output terminal for outputting a predicted classification for said at least one unclassified example (Fig. 2, item 24)

- a processor controlled by said stored programs for identifying the predicted classification of said at least one unclassified example, wherein said processor includes (Fig. 2, item 21)

- classification allocation means for allocating potential classifications to each said unclassified example and for generating a plurality of classification sets, each said classification set containing said plurality of training classified examples with their classification and said at least one unclassified example with its allocated potential classification (column 5, lines 42-51, "As shown in FIG. 3 ... program module")

- assay means including an example valuation device which determines individual strangeness values for each said training classified example and said at least one unclassified example having an allocated potential classification, the assay means determining an overall strangeness value valid under the iid assumption for each said

classification set in dependence on said individual strangeness values (Figs. 4-8; Fig. 9, items 94-96; column 7, lines 1-12, "FIG. 5 shows an ...the training data")

- a strength of prediction monitoring device for determining a confidence value for said predicted classification on the basis of said overall strangeness value assigned by said assay means to one of said classification sets (Fig. 6; Fig. 9, items 94-96; column 10, lines 32-36, "The execution history ... control processing module 15"; column 13, lines 13-23, "an input pattern ... increase the reliability")

Mizuno et al doesn't explicitly teach a strength of prediction monitoring device for determining a confidence value for said predicted classification on the basis of said overall strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs, a comparative device for selecting the classification set to which the most likely allocated potential classification for said at least one unclassified example belongs, wherein the predicted classification output by said output terminal is the most likely allocated potential classification according to said overall strangeness values assigned by said assay means or a single strangeness value (d(y)) valid under the independently and identically distributed assumption while *Tsuboka* teaches,

- second most likely allocated potential classification of said at least one unclassified example belongs (column 11, lines 11-20, "In ordinary vector ... the object function")

- a comparative device for selecting the classification set to which the most likely allocated potential classification for said at least one unclassified example belongs,

wherein the predicted classification output by said output terminal is the most likely allocated potential classification according to said overall strangeness values assigned by said assay means (Abstract, "A method and ... y is compared"; column 11, lines 11-20, "In ordinary vector ... the object function")

McDonough et al teaches,

- a single strangeness value (column 2, lines 9-19, "While it is ... were initially misclassified") valid under the independently and identically distributed assumption (column 8, lines 54-59, "There are several classes ... in a multinomial model")
- a strength of prediction monitoring device for determining a confidence value (column 5, lines 62-67, "The event frequencies ... that a particular"; column 6, lines 1-3, "known topic is ... ongoing, training procedure") for said predicted classification on the basis of said single strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs

Kulkarni et al teaches,

- a strength of prediction monitoring device (Abstract).

However, Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

Motivation – The portions of the claimed apparatus would have been a highly desirable feature in this art for maintaining accuracy (*Tsuboka*, column 4, lines 34-44, "Such phenomenon is ... discrete HMM computations"), working when little or no transcribed training data is available for the topic modeling component of the discriminator

(*McDonough et al*, column 12, lines 42-64, "The topic discriminator ... it is available") and characterizing when strongly consistent estimators exist (*Kulkarni et al*, page 255, INTRODUCTION AND FORMULATION section, paragraph 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Mizuno et al* as taught by *Tsuboka, McDonough et al* and *Kulkarni et al* for the purpose of maintaining accuracy when little or no transcribed training data is available as well as characterizing strongly consistent estimators. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a single strangeness value (d(y)) since Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

Regarding claim 15:

Mizuno et al teaches,

- inputting a plurality of training classified examples and at least one unclassified example (FIG. 2, item 23)

- identifying a predicted classification of said at least one unclassified example which includes (column 2, lines 54-59, "classification includes steps ... of the comparison")

- allocating potential classifications to each said unclassified example (column 5, lines 42-51, "As shown in FIG. 3 ... program module")

- generating a plurality of classification sets, each said classification set containing said plurality of training classified examples with their classification and said at least one unclassified example with its allocated potential classification (column 5, lines 42-51, "As shown in FIG. 3 ... program module")

- determining an individual strangeness value for each said training classified example and said at least one unclassified example having an allocated potential classification, and an overall strangeness value valid under the iid assumption for each said classification set in dependence on the individual strangeness values (Figs. 4-8; Fig. 9, items 94-96; column 7, lines 1-12, "FIG. 5 shows an ...the training data")
- selecting the said classification set to which the most likely allocated potential classification for said at least one unclassified example belongs, wherein said predicted classification is the most likely allocated potential classification in dependence on said overall strangeness values (Fig. 9, items 94-96; column 2, lines 54-59, "classification includes steps ... of the comparison"; column 9, lines 14-26, "an input pattern ... to the user")
- determining a confidence value for said predicted classification on the basis of the overall strangeness value assigned to one of said classification sets (Fig. 6; Fig. 9, items 94-96; column 10, lines 32-36, "The execution history ... control processing module 15"; column 13, lines 13-23, "an input pattern ... increase the reliability")
- outputting said predicted classification for said at least one unclassified example and said confidence value for said predicted classification (Figs. 7, 9; column 4, lines 16-27, "the input pattern ... supplied input pattern")

Mizuno et al doesn't explicitly teach determining a confidence value for said predicted classification on the basis of the overall strangeness value assigned to one of said classification sets to which the second most likely allocated potential classification for

said at least one unclassified example belongs or a single strangeness value (d(y)) valid under the independently and identically distributed assumption while *Tsuboka* teaches,

- a second most likely allocated potential classification for said at least one unclassified example belongs (column 11, lines 11-20, "In ordinary vector ... the object function")

McDonough et al teaches,

- a single strangeness value (column 2, lines 9-19, "While it is ... were initially misclassified") valid under the independently and identically distributed assumption (column 8, lines 54-59, "There are several classes ... in a multinomial model")
- a strength of prediction monitoring device for determining a confidence value (column 5, lines 62-67, "The event frequencies ... that a particular"; column 6, lines 1-3, "known topic is ... ongoing, training procedure") for said predicted classification on the basis of said single strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs

Kulkarni et al teaches,

- a strength of prediction monitoring device (Abstract).

However, Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

<u>Motivation</u> – The portions of the claimed method would have been a highly desirable feature in this art for maintaining accuracy (*Tsuboka*, column 4, lines 34-44, "Such phenomenon is ... discrete HMM computations"), working when little or no transcribed training data is available for the topic modeling component of the discriminator

(*McDonough et al*, column 12, lines 42-64, "The topic discriminator ... it is available") and characterizing when strongly consistent estimators exist (*Kulkarni et al*, page 255, INTRODUCTION AND FORMULATION section, paragraph 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Mizuno et al* as taught by *Tsuboka, McDonough et al* and *Kulkarni et al* for the purpose of maintaining accuracy when little or no transcribed training data is available as well as characterizing strongly consistent estimators. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a single strangeness value (d(y)) since Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

Regarding claim 17:

The rejection of claim 17 is similar to that for claim 15 as recited above since the stated limitations of the claim are set forth in the references. Claim 17's limitations difference is taught in *Mizuno et al* :

- said selected classification set is selected without the application of any general rules determined from the said training set (column 2, lines 54-59, "classification includes steps ... of the comparison"; column 9, lines 14-26, "an input pattern ... to the user")

Regarding claim 18:

Mizuno et al teaches,

- determining a confidence value for said predicted classification on the basis of said overall strangeness value assigned to one of said classification sets (Fig. 6; Fig. 9,

items 94-96; column 10, lines 32-36, "The execution history ... control processing module 15"; column 13, lines 13-23, "an input pattern ... increase the reliability")

- generating a plurality of classification sets, each said classification set containing a plurality of training classified examples with their classification and at least one unclassified example that has been allocated a potential classification (column 2, lines 54-59, "classification includes steps ... of the comparison"; column 5, lines 42-51, "As shown in FIG. 3 ... program module")

- determining a an individual strangeness value for each said training classified example and said at least one unclassified example having an allocated potential classification, and an overall strangeness value valid under the iid assumption for each said classification set in dependence on said individual strangeness values (Figs. 4-8; Fig. 9, items 94-96; column 7, lines 1-12, "FIG. 5 shows an ...the training data")

- selecting the classification set to which the most likely allocated potential classification for the said at least one unclassified example belongs, wherein the predicted classification is the most likely allocated potential classification in dependence on said overall strangeness values (Fig. 9, items 94-96; column 2, lines 54-59, "classification includes steps ... of the comparison"; column 9, lines 14-26, "an input pattern ... to the user")

Mizuno et al doesn't explicitly teach determining a confidence value for said predicted classification on the basis of said overall strangeness value assigned to one of said classification sets to which the second most likely allocated potential classification for

said at least one unclassified example belongs or a single strangeness value (d(y)) valid under the independently and identically distributed assumption while *Tsuboka* teaches,

- a second most likely allocated potential classification for said at least one unclassified example belongs (column 11, lines 11-20, "In ordinary vector ... the object function")

McDonough et al teaches,

- a single strangeness value (d(y)) (column 2, lines 9-19, "While it is ... were initially misclassified") valid under the independently and identically distributed assumption (column 8, lines 54-59, "There are several classes ... in a multinomial model")
- a strength of prediction monitoring device for determining a confidence value (column 5, lines 62-67, "The event frequencies ... that a particular"; column 6, lines 1-3, "known topic is ... ongoing, training procedure") for said predicted classification on the basis of said single strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs

Kulkarni et al teaches,

- a strength of prediction monitoring device (Abstract).

However, Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

<u>Motivation</u> – The portions of the claimed apparatus would have been a highly desirable feature in this art for maintaining accuracy (*Tsuboka*, column 4, lines 34-44, "Such phenomenon is ... discrete HMM computations"), working when little or no transcribed training data is available for the topic modeling component of the discriminator

(*McDonough et al*, column 12, lines 42-64, "The topic discriminator ... it is available") and characterizing when strongly consistent estimators exist (*Kulkarni et al*, page 255, INTRODUCTION AND FORMULATION section, paragraph 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Mizuno et al* as taught by *Tsuboka, McDonough et al* and *Kulkarni et al* for the purpose of maintaining accuracy when little or no transcribed training data is available as well as characterizing strongly consistent estimators. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a single strangeness value (d(y)) since Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

Claim 12 stands rejected under 35 U.S.C. 103(a) as being obvious over *Mizuno et al* in view of *Tsuboka* in view of *McDonough et al* in view of *Kulkarni et al* and in further view of *Feyh* "Statistics of maximum entropy IID noise given its cumulants" (26-28 Oct. 1992).

Regarding claim 12:

Mizuno et al teaches,

- an input device for receiving a plurality of training classified examples and at least one unclassified example (FIG. 2, item 23)
- a memory for storing said classified and unclassified examples (column 2, lines 54-59, "classification includes steps ... of the comparison")

- an output terminal for outputting a predicted classification for said at least one unclassified example (Fig. 2, item 24)

- a processor for identifying the predicted classification of said at least one unclassified example (Fig. 2, item 21)

- wherein the processor includes:

- classification allocation means for allocating potential classifications to each said unclassified example and for generating a plurality of classification sets, each said classification set containing said plurality of training classified examples with their classification and said at least one unclassified example with its said allocated potential classification (column 5, lines 42-51, "As shown in FIG. 3 ... program module")

- assay means including an example valuation device which determines individual strangeness values for each said training classified example and said at least one unclassified example having an allocated potential classification, the assay means determining an overall strangeness value valid under the iid assumption for each said classification set in dependence on said individual strangeness values (Figs. 4-8; Fig. 9, items 94-96; column 7, lines 1-12, "FIG. 5 shows an ...the training data")

- a strength of prediction monitoring device (column 11, lines 19-47, "FIG. 10 is a ... and a display 24") for determining a confidence value for said predicted classification on the basis of said overall strangeness value assigned by said assay means to one of said classification sets (Fig. 6; Fig. 9, items 94-96; column 10, lines 32-36, "The execution history ... control processing module 15"; column 13, lines 13-23, "an input pattern ... increase the reliability")

Mizuno et al doesn't explicitly teach a strength of prediction monitoring device for determining a confidence value for said predicted classification on the basis of said overall strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs, a comparative device for selecting the classification set to which the most likely allocated potential classification for said at least one unclassified example belongs, wherein said predicted classification output by the output terminal is said most likely allocated classification according to said overall strangeness values assigned by said assay means, a single strangeness value (d(y)) valid under the independently and identically distributed assumption or Lagrange multipliers are used to determine said individual strangeness values while *Tsuboka* teaches,

- a second most likely allocated potential classification of said at least one unclassified example belongs (column 11, lines 11-20, "In ordinary vector ... the object function")
- a comparative device for selecting the classification set to which the most likely allocated potential classification for said at least one unclassified example belongs, wherein said predicted classification output by the output terminal is said most likely allocated classification according to said overall strangeness values assigned by said assay means (Abstract, "A method and ... y is compared"; column 11, lines 11-20, "In ordinary vector ... the object function")
- Lagrange multipliers are used to determine said individual strangeness values (column 9, lines 10-37, "Here, defining ... using Lagrange multipliers")

McDonough et al teaches,

- a single strangeness value (column 2, lines 9-19, "While it is ... were initially misclassified") valid under the independently and identically distributed assumption (column 8, lines 54-59, "There are several classes ... in a multinomial model")

- a strength of prediction monitoring device for determining a confidence value (column 5, lines 62-67, "The event frequencies ... that a particular"; column 6, lines 1-3, "known topic is ... ongoing, training procedure") for said predicted classification on the basis of said single strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs

Kulkarni et al teaches,

- a strength of prediction monitoring device (Abstract).

Feyh teaches,

- Lagrange multipliers are used to determine said individual strangeness values (Abstract, "Higher Order Statistics ... and Bessel functions")

However, Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

<u>Motivation</u> – The portions of the claimed apparatus would have been a highly desirable feature in this art for maintaining accuracy (*Tsuboka*, column 4, lines 34-44, "Such phenomenon is ... discrete HMM computations"), working when little or no transcribed training data is available for the topic modeling component of the discriminator (*McDonough et al*, column 12, lines 42-64, "The topic discriminator ... it is available"), characterizing when strongly consistent estimators exist (*Kulkarni et al*, page 255,

INTRODUCTION AND FORMULATION section, paragraph 1) and maximizing the differential entropy of the noise (*Feyh*, page 736, section 1, paragraph 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Mizuno et al* as taught by *Tsuboka, McDonough et al* and *Kulkarni et al* for the purpose of maintaining accuracy when little or no transcribed training data is available as well as characterizing strongly consistent estimators and maximizing differential entropy. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a single strangeness value (d(y)) since Examiner takes Official Notice that a single strangeness value (d(y)) is conventional and well-known.

RESPONSE TO APPLICANTS' AMENDMENT REMARKS

Applicant argues that column 7, lines 1-12 of *Mizuno et al* USPN 5,577,166 do not show the determination of an individual strangeness value for each training example and an unknown example and then the determination of a single strangeness value for each training example and an unknown example and then the determination of a single strangeness value for each classification set, in dependence on the individual strangeness value and *Mizuno et al* does not show the claim 10 formula (Amendment, REMARKS page 8, paragraph 3), *Mizuno et al* does not suggest determining a single strangeness value valid under the iid assumption, teaches away from the invention, rather than towards it and does not suggest determining individual strangeness values and then a single strangeness value, either in general or on the basis of the claimed

formula, nor the strength of prediction monitoring device for a confidence value on the basis of the single strangeness value of the second most likely potential classification (Amendment REMARKS page 9, paragraph 1), *Tsuboka* USPN 5,608,841 does not use the iid assumption, the second most likely classification as a strength of prediction monitoring device, show the use of the claim 10 formula or suggest using the second most likely allocated potential classification as a strength of prediction monitoring device for determining a confidence value of the predicted classification (Amendment REMARKS page 9, paragraphs 3-4 and page 10, paragraph 1), the combination of *Mizuno et al* and *Tsuboka* would not ensure that the strangeness value is valid under the iid assumption, does not show the use of the second most likely classification as the strength of prediction monitoring device to provide a confidence value for the correctness of the predicted classification and fails to show the use of the formula enumerated in the claim (Amendment REMARKS page 10, paragraphs 2-3). Applicant's arguments have been fully considered, but are moot in view of the above new grounds of rejection.

The examiner agrees that *Mizuno et al* and *Tsuboka* taken either individually or in combination do not disclose the method, apparatus and data carrier of the inventions defined in claims 10, 12, 14-15 and 17-18. However, *McDonough et al* USPN 5,625,748 and *Kulkarni et al* "On the existence of strongly consistent rules for estimation and classification" are cited individually and in combination for explicitly and inherently disclosing the subject matter set forth in the claims by the applicants: determining a single strangeness value valid under the iid assumption and the strength of prediction

monitoring device for a confidence value on the basis of the single strangeness value of the second most likely potential classification, for examples.

Column 2, lines 9-19 and column 8, lines 54-59 of *McDonough et al* presents the determining a single strangeness value valid under the iid assumption while column 5, lines 62-67 and column 6, lines 1-3 with *Kulkarni et al's* Abstract show the strength of prediction monitoring device for a confidence value on the basis of the single strangeness value of the second most likely potential classification. Furthermore, the purpose and motivation for modifying *Mizuno et al* as taught by other references include maintaining accuracy (*Tsuboka*, column 4, lines 34-44), working when little or no transcribed training data is available for the topic modeling component of the discriminator (*McDonough et al*, column 12, lines 42-64) and characterizing when strongly consistent estimators exist (*Kulkarni et al*, page 255, INTRODUCTION AND FORMULATION section, paragraph 1).

As set forth above with regards to *Mizuno et al*, *Tsuboka, McDonough et al* and *Kulkarni et al*, the items listed explicitly and inherently teach each element of the applicants' claimed limitations. Applicants have not set forth any distinction or offered any dispute between the claims of the subject application, *Mizuno et al's* Method and apparatus for classifying patterns by use of neural network, *Tsuboka's* Method and apparatus for pattern recognition employing the hidden Markov model, *McDonough et al's* Method and apparatus for classifying patterns by use of neural network and *Kulkarni et al*'s "On the existence of strongly consistent rules for estimation and classification".

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- *Pincus*; USPN 5,846,189; System for quantifying asynchrony between signals

- *Milner*; USPN 6,278,970; Speech transformation using log energy and orthogonal matrix

- *Proedrou et al*; Transductive Confidence Machines for Pattern Recognition; ECML LNAI 2430; 2002; pp 381-390

- *Melluish et al*; Comparing the Bayes and typicalness frameworks; Proceedings of ECML 01, Lecture Notes; 2001; pp 1-13

Any inquiry concerning this communication or earlier communications from the Office should be directed to Meltin Bell whose telephone number is 703-305-0362. This Examiner can normally be reached on Mon - Fri 7:30 am - 4:30 pm.

If attempts to reach this Examiner by telephone are unsuccessful, his supervisor, Anthony Knight, can be reached on 703-308-3179. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Anthony Knight
Supervisory Patent Examiner
Group 3600

MB
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